Welding Proximity Sensor

# E2EW Series

DC 3-wire

## Stable detection in lines containing both aluminum and iron

- Equivalent sensing distances for both iron and aluminum *1
- Enables common design for lines with both iron and aluminum *1
- The exceptional sensing range *2, which means fewer false detections and thereby fewer unexpected stoppages.
- OMRON's unique fluororesin coating technologies enable long-lasting spatter resistance *4, which lasts 60 times *3 longer than previous models.
- Durable full metal body to reduce unexpected stoppages
- 2-output (NO+NC) models and models with IO-Link are also available.
- The laser printing on the sensor head let you know the sensing distance at glance. *5
- Equipped with a function, which effectively cancels pulse noise of current magnetic field. *1
- UL certification (UL60947-5-2) and CSA certification (CSA C22.2 UL60947-5-2-14)

*1. PREMIUM Models only.
*2. Based on June 2019 OMRON investigation.
*3. Comparison with E2EF-Q products. Based on June 2019 OMRON investigation.
*4. Models with spatter-resistant coating only.
*5. Models without spatter-resistant coating only.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read *Safety Precautions* on page 37.

## E2EW Series Model Number Legend

### DC 3-wire

E2EW - (1) X (2) (3) (4) (5) (6) - (7) (8)

| No. | Type | Code | Meaning |
|---|---|---|---|
| (1) | Case | Blank | Without spatter-resistant coating |
| | | Q | With spatter-resistant coating |
| (2) | Sensing distance | Number | Sensing distance (Unit: mm) |
| (3) | Output configuration | B | PNP open collector |
| | | C | NPN open collector |
| (4) | Operation mode | 1 | Normally open (NO) |
| | | 2 | Normally closed (NC) |
| | | 3 | Normally open, Normally closed (NO+NC) |
| (5) | IO-Link baud rate | Blank | Non IO-Link compliant |
| | | D | COM2 (38.4kbps) |
| | | T | COM3 (230.4kbps) |
| (6) | Size | 12 | M12 |
| | | 18 | M18 |
| | | 30 | M30 |
| (7) | Connection method | Blank | Pre-wired Models |
| | | M1TJ | M12 Pre-wired Smartclick Connector Models |
| (8) | Cable length | Number M | Cable length |

**Note:** The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers.

# Ordering Information

PREMIUM Model

## E2EW Series (Quadruple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded *1**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M18 (12 mm) | Pre-wired (2 m) *2 | NO | E2EW-X12B1T18 2M | E2EW-X12C118 2M |
| | | NC | E2EW-X12B218 2M | E2EW-X12C218 2M |
| | | NO+NC | E2EW-X12B3T18 2M | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | E2EW-X12B1T18-M1TJ 0.3M | E2EW-X12C118-M1TJ 0.3M |
| | | NC | E2EW-X12B218-M1TJ 0.3M | E2EW-X12C218-M1TJ 0.3M |
| | | NO+NC | E2EW-X12B3T18-M1TJ 0.3M | --- |
| M30 (22 mm) | Pre-wired (2 m) *2 | NO | E2EW-X22B1T30 2M | E2EW-X22C130 2M |
| | | NC | E2EW-X22B230 2M | E2EW-X22C230 2M |
| | | NO+NC | E2EW-X22B3T30 2M | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | E2EW-X22B1T30-M1TJ 0.3M | E2EW-X22C130-M1TJ 0.3M |
| | | NC | E2EW-X22B230-M1TJ 0.3M | E2EW-X22C230-M1TJ 0.3M |
| | | NO+NC | E2EW-X22B3T30-M1TJ 0.3M | --- |

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X12B1T18 5M)

**Note: 1.** Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-X□□□D□" (Example: E2EW-X12B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.
**2.** IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

PREMIUM Model

## E2EW Series (Triple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded *1**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M18 (10 mm) | Pre-wired (2 m) *2 | NO | **E2EW-X10B1T18 2M** | **E2EW-X10C118 2M** |
| | | NC | **E2EW-X10B218 2M** | **E2EW-X10C218 2M** |
| | | NO+NC | **E2EW-X10B3T18 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-X10B1T18-M1TJ 0.3M** | **E2EW-X10C118-M1TJ 0.3M** |
| | | NC | **E2EW-X10B218-M1TJ 0.3M** | **E2EW-X10C218-M1TJ 0.3M** |
| | | NO+NC | **E2EW-X10B3T18-M1TJ 0.3M** | --- |
| M30 (20 mm) | Pre-wired (2 m) *2 | NO | **E2EW-X20B1T30 2M** | **E2EW-X20C130 2M** |
| | | NC | **E2EW-X20B230 2M** | **E2EW-X20C230 2M** |
| | | NO+NC | **E2EW-X20B3T30 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-X20B1T30-M1TJ 0.3M** | **E2EW-X20C130-M1TJ 0.3M** |
| | | NC | **E2EW-X20B230-M1TJ 0.3M** | **E2EW-X20C230-M1TJ 0.3M** |
| | | NO+NC | **E2EW-X20B3T30-M1TJ 0.3M** | --- |

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X10B1T18 5M)

**Note: 1.** Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-X□□□D□" (Example: E2EW-X10B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.
**2.** IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

PREMIUM Model

## E2EW-Q Series (Spatter-resistant Quadruple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded *1**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M18 (12 mm) | Pre-wired (2 m) *2 | NO | **E2EW-QX12B1T18 2M** | **E2EW-QX12C118 2M** |
| | | NC | **E2EW-QX12B218 2M** | **E2EW-QX12C218 2M** |
| | | NO+NC | **E2EW-QX12B3T18 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX12B1T18-M1TJ 0.3M** | **E2EW-QX12C118-M1TJ 0.3M** |
| | | NC | **E2EW-QX12B218-M1TJ 0.3M** | **E2EW-QX12C218-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX12B3T18-M1TJ 0.3M** | --- |
| M30 (22 mm) | Pre-wired (2 m) *2 | NO | **E2EW-QX22B1T30 2M** | **E2EW-QX22C130 2M** |
| | | NC | **E2EW-QX22B230 2M** | **E2EW-QX22C230 2M** |
| | | NO+NC | **E2EW-QX22B3T30 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX22B1T30-M1TJ 0.3M** | **E2EW-QX22C130-M1TJ 0.3M** |
| | | NC | **E2EW-QX22B230-M1TJ 0.3M** | **E2EW-QX22C230-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX22B3T30-M1TJ 0.3M** | --- |

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX12B1T18 5M)

**Note: 1.** Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-QX□□□D□" (Example: E2EW-QX12B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.
**2.** IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

PREMIUM Model

## E2EW-Q Series (Spatter-resistant Triple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded *1**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M18 (10 mm) | Pre-wired (2 m) *2 | NO | **E2EW-QX10B1T18 2M** | **E2EW-QX10C118 2M** |
| | | NC | **E2EW-QX10B218 2M** | **E2EW-QX10C218 2M** |
| | | NO+NC | **E2EW-QX10B3T18 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX10B1T18-M1TJ 0.3M** | **E2EW-QX10C118-M1TJ 0.3M** |
| | | NC | **E2EW-QX10B218-M1TJ 0.3M** | **E2EW-QX10C218-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX10B3T18-M1TJ 0.3M** | --- |
| M30 (20 mm) | Pre-wired (2 m) *2 | NO | **E2EW-QX20B1T30 2M** | **E2EW-QX20C130 2M** |
| | | NC | **E2EW-QX20B230 2M** | **E2EW-QX20C230 2M** |
| | | NO+NC | **E2EW-QX20B3T30 2M** | --- |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX20B1T30-M1TJ 0.3M** | **E2EW-QX20C130-M1TJ 0.3M** |
| | | NC | **E2EW-QX20B230-M1TJ 0.3M** | **E2EW-QX20C230-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX20B3T30-M1TJ 0.3M** | --- |

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX10B1T18 5M)

**Note: 1.** Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-QX□□□D□" (Example: E2EW-QX10B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.
**2.** IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

BASIC Model

## E2EW Series (Single distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M12 (2 mm) | Pre-wired (2 m) * | NO | **E2EW-X2B112 2M** | **E2EW-X2C112 2M** |
| | | NC | **E2EW-X2B212 2M** | **E2EW-X2C212 2M** |
| | | NO+NC | **E2EW-X2B312 2M** | **E2EW-X2C312 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-X2B112-M1TJ 0.3M** | **E2EW-X2C112-M1TJ 0.3M** |
| | | NC | **E2EW-X2B212-M1TJ 0.3M** | **E2EW-X2C212-M1TJ 0.3M** |
| | | NO+NC | **E2EW-X2B312-M1TJ 0.3M** | **E2EW-X2C312-M1TJ 0.3M** |
| M18 (5 mm) | Pre-wired (2 m) * | NO | **E2EW-X5B118 2M** | **E2EW-X5C118 2M** |
| | | NC | **E2EW-X5B218 2M** | **E2EW-X5C218 2M** |
| | | NO+NC | **E2EW-X5B318 2M** | **E2EW-X5C318 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-X5B118-M1TJ 0.3M** | **E2EW-X5C118-M1TJ 0.3M** |
| | | NC | **E2EW-X5B218-M1TJ 0.3M** | **E2EW-X5C218-M1TJ 0.3M** |
| | | NO+NC | **E2EW-X5B318-M1TJ 0.3M** | **E2EW-X5C318-M1TJ 0.3M** |
| M30 (10 mm) | Pre-wired (2 m) * | NO | **E2EW-X10B130 2M** | **E2EW-X10C130 2M** |
| | | NC | **E2EW-X10B230 2M** | **E2EW-X10C230 2M** |
| | | NO+NC | **E2EW-X10B330 2M** | **E2EW-X10C330 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-X10B130-M1TJ 0.3M** | **E2EW-X10C130-M1TJ 0.3M** |
| | | NC | **E2EW-X10B230-M1TJ 0.3M** | **E2EW-X10C230-M1TJ 0.3M** |
| | | NO+NC | **E2EW-X10B330-M1TJ 0.3M** | **E2EW-X10C330-M1TJ 0.3M** |

* Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X2B112 5M)

**Note:** IO-Link is not supported for all types of BASIC Model.

BASIC Model

## E2EW-Q Series (Spatter-resistant Single distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

**Shielded**

| Size (Sensing distance) | Connection method | Operation mode | Model | |
|---|---|---|---|---|
| | | | PNP | NPN |
| M12 (2 mm) | Pre-wired (2 m) * | NO | **E2EW-QX2B112 2M** | **E2EW-QX2C112 2M** |
| | | NC | **E2EW-QX2B212 2M** | **E2EW-QX2C212 2M** |
| | | NO+NC | **E2EW-QX2B312 2M** | **E2EW-QX2C312 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX2B112-M1TJ 0.3M** | **E2EW-QX2C112-M1TJ 0.3M** |
| | | NC | **E2EW-QX2B212-M1TJ 0.3M** | **E2EW-QX2C212-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX2B312-M1TJ 0.3M** | **E2EW-QX2C312-M1TJ 0.3M** |
| M18 (5 mm) | Pre-wired (2 m) * | NO | **E2EW-QX5B118 2M** | **E2EW-QX5C118 2M** |
| | | NC | **E2EW-QX5B218 2M** | **E2EW-QX5C218 2M** |
| | | NO+NC | **E2EW-QX5B318 2M** | **E2EW-QX5C318 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX5B118-M1TJ 0.3M** | **E2EW-QX5C118-M1TJ 0.3M** |
| | | NC | **E2EW-QX5B218-M1TJ 0.3M** | **E2EW-QX5C218-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX5B318-M1TJ 0.3M** | **E2EW-QX5C318-M1TJ 0.3M** |
| M30 (10 mm) | Pre-wired (2 m) * | NO | **E2EW-QX10B130 2M** | **E2EW-QX10C130 2M** |
| | | NC | **E2EW-QX10B230 2M** | **E2EW-QX10C230 2M** |
| | | NO+NC | **E2EW-QX10B330 2M** | **E2EW-QX10C330 2M** |
| | M12 Pre-wired Smartclick Connector (0.3 m) | NO | **E2EW-QX10B130-M1TJ 0.3M** | **E2EW-QX10C130-M1TJ 0.3M** |
| | | NC | **E2EW-QX10B230-M1TJ 0.3M** | **E2EW-QX10C230-M1TJ 0.3M** |
| | | NO+NC | **E2EW-QX10B330-M1TJ 0.3M** | **E2EW-QX10C330-M1TJ 0.3M** |

* Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX2B112 5M)

**Note:** IO-Link is not supported for all types of BASIC Model.

## Accessories (Sold Separately)

### Sensor I/O Connectors

**(Models for Pre-wired Connectors) A Sensor I/O Connector is not provided with the Sensor. It must be ordered separately as required.**

**Round Water-resistant Connectors XS5 series**

| Appearance | Cable Specification | Type | Cable diameter (mm) | Cable Connection Direction | Cable length (m) | Sensor I/O Connector model number | Applicable Proximity Sensor model number |
|---|---|---|---|---|---|---|---|
| M12 Smartclick Connector<br>Straight type<br>  | PVC robot cable | Sockets on One Cable End | 6 dia. | Straight | 1 | **XS5F-D421-C80-F** | E2EW-X□□□-M1TJ<br>E2EW-QX□□□-M1TJ |
| | | | | | 2 | **XS5F-D421-D80-F** | |
| | | | | | 3 | **XS5F-D421-E80-F** | |
| | | | | | 5 | **XS5F-D421-G80-F** | |
| | | | | | 10 | **XS5F-D421-J80-F** | |
| | | | | Right-angle | 1 | **XS5F-D422-C80-F** | |
| | | | | | 2 | **XS5F-D422-D80-F** | |
| | | | | | 3 | **XS5F-D422-E80-F** | |
| | | | | | 5 | **XS5F-D422-G80-F** | |
| | | | | | 10 | **XS5F-D422-J80-F** | |
| Right-angle type<br>  | | Socket and Plug on Cable Ends | 6 dia. | Straight (Socket)/ Straight (Plug) | 1 | **XS5W-D421-C81-F** | |
| | | | | | 2 | **XS5W-D421-D81-F** | |
| | | | | | 3 | **XS5W-D421-E81-F** | |
| | | | | | 5 | **XS5W-D421-G81-F** | |
| | | | | | 10 | **XS5W-D421-J81-F** | |
| | | | | Right-angle (Socket)/ Right-angle (Plug) | 2 | **XS5W-D422-D81-F** | |
| | | | | | 5 | **XS5W-D422-G81-F** | |
| | | | | Straight (Socket)/ Right-angle (Plug) | 2 | **XS5W-D423-D81-F** | |
| | | | | | 5 | **XS5W-D423-G81-F** | |
| | | | | Right-angle (Socket)/ Straight (Plug) | 2 | **XS5W-D424-D81-F** | |
| | | | | | 5 | **XS5W-D424-G81-F** | |

**Note:** For details of the connector, refer to *XS5 Series* on page 42.

# Ratings and Specifications

PREMIUM Model

## E2EW Series (Quadruple/Triple distance model)
## E2EW-Q Series (Spatter-resistant Quadruple/Triple distance model)

### DC 3-wire
**Shielded**

| Item | Type | Quadruple distance model | | Triple distance model | |
|---|---|---|---|---|---|
| | Size | M18 | M30 | M18 | M30 |
| | Model | E2EW-(Q)X12□18 | E2EW-(Q)X22□30 | E2EW-(Q)X10□18 | E2EW-(Q)X20□30 |
| Sensing distance | | 12 mm ±10% | 22 mm ±10% | 10 mm ±10% | 20 mm ±10% |
| Setting distance | | 0 to 8.4 mm | 0 to 15.4 mm | 0 to 7.0 mm | 0 to 14 mm |
| Differential travel | | 15% max. of sensing distance | | | |
| Detectable object | | Ferrous metals and non-ferrous metals (The sensing distance depends on the material of the sensing object. Refer to *Engineering Data* on page 25.) | | | |
| Standard sensing object | | Iron, 36 × 36 × 1 mm | Iron, 66 × 66 × 1 mm | Iron, 30 × 30 × 1 mm | Iron, 60 × 60 × 1 mm |
| Response frequency *1 *2 | | 2 Hz | | | |
| Power supply voltage | | 10 to 30 VDC (including 10% ripple (p-p)), Class 2 | | | |
| Current consumption | | 720 mW max. (Current consumption: 30 mA max. at power supply voltage of 24 V) | | | |
| Output configuration | | B□ Models: PNP open collector, C□ Models: NPN open collector | | | |
| Operation mode | | 1-output models (B1, C1): NO (Normally open), 1-output models (B2, C2): NC (Normally closed), 2-output models (B3): NO+NC (Normally open, Normally closed) | | | |
| Control output | Load current | 1-output models (B1,B2,C1,C2): 10 to 30 VDC, Class 2, 200 mA max. 2-output models (B3): 10 to 30 VDC, Class 2, 100 mA max. | | | |
| | Residual voltage | 1-output models (B1,B2,C1,C2): 2 V max. (Load current: 200 mA, Cable length: 2 m) 2-output models (B3): 2 V max. (Load current: 100 mA, Cable length: 2 m) | | | |
| Indicator | | In the Standard I/O mode (SIO mode): Operation indicator (orange, lit) and communication indicator (green, not lit) In the IO-Link communication mode (COM mode): Operation indicator (orange, lit) and communication indicator (green, blinking at 1 s intervals) | | | |
| Protection circuits | | Power supply reverse polarity protection, Surge suppressor, Output short-circuit protection, Output reverse polarity protection | | | |
| Ambient temperature range | | Operating: 0 to 85 °C, Storage: -15 to 85 °C (with no icing or condensation) *4 | | | |
| Ambient humidity range | | Operating/Storage: 35% to 95% (with no condensation) | | | |
| Temperature influence | | ±20% max. of sensing distance at 23 °C in the temperature range of 0 to 85 °C | | | |
| Voltage influence | | ±1.5% max. of sensing distance at rated voltage in the rated voltage ±15% range | | | |
| Insulation resistance | | 50 MΩ min. (at 500 VDC) between current-carrying parts and case | | | |
| Dielectric strength | | 1,000 VAC, 50/60 Hz for 1 minute between current-carrying parts and case | | | |
| Vibration resistance (destruction) | | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | | |
| Shock resistance (destruction) | | 1,000 $m/s^2$ 10 times each in X, Y, and Z directions | | | |
| Degree of protection | | IEC 60529: IP67 | | | |
| Connection method | | Pre-wired Models (Standard cable length: 2 m), Pre-wired Connector Models (Standard cable length: 0.3 m) | | | |
| Weight (packed state) | Pre-wired | Approx. 165 g | Approx. 225 g | Approx. 165 g | Approx. 225 g |
| | M12 Pre-wired Smartclick Connector | Approx. 100 g | Approx. 160 g | Approx. 100 g | Approx. 160 g |
| Materials | Case | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | | |
| | Sensing surface | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | | |
| | Sensing surface (Thickness) | 0.4 mm | 0.5 mm | 0.4 mm | 0.5 mm |
| | Clamping nuts | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | | |
| | Toothed washers | Zinc-plated iron | | | |
| | Cable | Vinyl chloride (PVC) | | | |
| Main IO-Link functions *3 | | Operation mode switching between NO and NC, self diagnosis enabling, excessive proximity judgment distance selecting, timer function of the control output and timer time selecting, instability output (IO-Link mode) ON delay timer time selecting function, monitor output, operating hours read-out, readout of the sensor internal temperature, and initial reset | | | |
| IO-Link Communication specifications *3 | IO-Link specification | Ver.1.1 | | | |
| | Baud rate | E2EW(-Q) X□B□T□: COM3 (230.4 kbps), E2EW(-Q) X□B□D□: COM2 (38.4 kbps) | | | |
| | Data length | PD size: 2 bytes, OD size: 1 byte (M-sequence type: TYPE_2_2) | | | |
| | Minimum cycle time | COM2: 2.3 ms, COM3: 1.0 ms | | | |
| Accessories | | Instruction manual, Clamping nuts, Toothed washer | | | |

*1. The response frequency is an average value.
*2. Factory setting: (timer function: ONOFF delay, timer time: 200 ms)
*3. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.
*4. UL temperature rating is between 0 °C to 60 °C.

BASIC Model

# E2EW Series (Single distance model)
# E2EW-Q Series (Spatter-resistant Single distance model)

## DC 3-wire
### Shielded

| Item | | Type | Single distance model | | |
|---|---|---|---|---|---|
| | | Size | M12 | M18 | M30 |
| | | Model | E2EW-(Q)X2□12 | E2EW-(Q)X5□18 | E2EW-(Q)X10□30 |
| Sensing distance | | | 2 mm ±10% | 5 mm ±10% | 10 mm ±10% |
| Setting distance | | | 0 to 1.4 mm | 0 to 3.5 mm | 0 to 7 mm |
| Differential travel | | | 10% max. of sensing distance | | |
| Detectable object | | | Ferrous metals and non-ferrous metals (The sensing distance depends on the material of the sensing object. Refer to *Engineering Data* on page 25.) | | |
| Standard sensing object | | | Iron, 12 × 12 × 1 mm | Iron, 18 × 18 × 1 mm | Iron, 30 × 30 × 1 mm |
| Response frequency *1 | | | 100 Hz | 80 Hz | 40 Hz |
| Power supply voltage | | | 10 to 30 VDC (including 10% ripple (p-p)), Class 2 | | |
| Current consumption | | | 1-output models (B1, B2, C1, C2): 16 mA max.<br>2-output models (B3, C3): 20 mA max. | | |
| Output configuration | | | B□ Models: PNP open collector,<br>C□ Models: NPN open collector | | |
| Operation mode | | | 1-output models (B1, C1): NO (Normally open),<br>1-output models (B2, C2): NC (Normally closed),<br>2-output models (B3, C3): NO+NC (Normally open, Normally closed) | | |
| Control output | Load current | | 1-output models (B1, B2, C1, C2): 10 to 30 VDC, Class 2, 200 mA max.<br>2-output models (B3, C3): 10 to 30 VDC, Class 2, 100 mA max. | | |
| | Residual voltage | | 1-output models (B1, B2, C1, C2): 2 V max. (Load current: 200 mA, Cable length: 2 m)<br>2-output models (B3, C3): 2 V max. (Load current: 100 mA, Cable length: 2 m) | | |
| Indicator | | | Operation indicator (orange, lit) and communication indicator (green, not lit) | | |
| Protection circuits | | | Power supply reverse polarity protection, Surge suppressor, Output short-circuit protection, Output reverse polarity protection | | |
| Ambient temperature range | | | Operating: 0 to 85 °C, Storage: -15 to 85 °C (with no icing or condensation) *2 | | |
| Ambient humidity range | | | Operating/Storage: 35% to 95% (with no condensation) | | |
| Temperature influence | | | ±20% max. of sensing distance at 23 °C in the temperature range of 0 to 85 °C | | |
| Voltage influence | | | ±1.5% max. of sensing distance at rated voltage in the rated voltage ±15% range | | |
| Insulation resistance | | | 50 MΩ min. (at 500 VDC) between current-carrying parts and case | | |
| Dielectric strength | | | 1,000 VAC, 50/60 Hz for 1 minute between current-carrying parts and case | | |
| Vibration resistance (destruction) | | | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | |
| Shock resistance (destruction) | | | 1,000 $m/s^2$ 10 times each in X, Y, and Z directions | | |
| Degree of protection | | | IEC 60529: IP67 | | |
| Connection method | | | Pre-wired Models (Standard cable length: 2 m), Pre-wired Connector Models (Standard cable length: 0.3 m) | | |
| Weight (packed state) | Pre-wired | | Approx. 140 g | Approx. 160 g | Approx. 225 g |
| | M12 Pre-wired Smartclick Connector | | Approx. 70 g | Approx. 95 g | Approx. 160 g |
| Materials | Case | | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | |
| | Sensing surface | | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | |
| | Sensing surface (Thickness) | | 0.8 mm | 0.8 mm | 0.8 mm |
| | Clamping nuts | | E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303)) | | |
| | Toothed washers | | Zinc-plated iron | | |
| | Cable | | Vinyl chloride (PVC) | | |
| Accessories | | | Instruction manual, Clamping nuts, Toothed washer | | |

*1. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.
*2. UL temperature rating is between 0 °C to 60 °C.

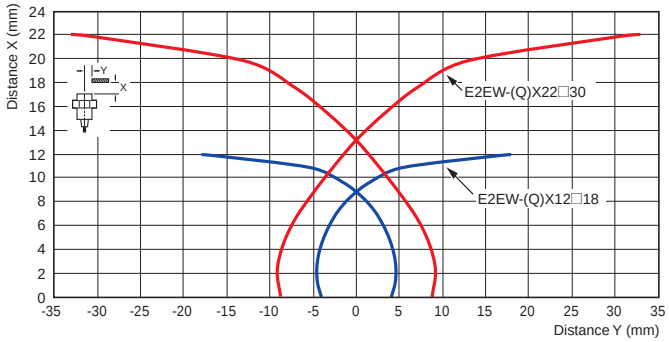
# Engineering Data (Reference Value)

## Sensing Area

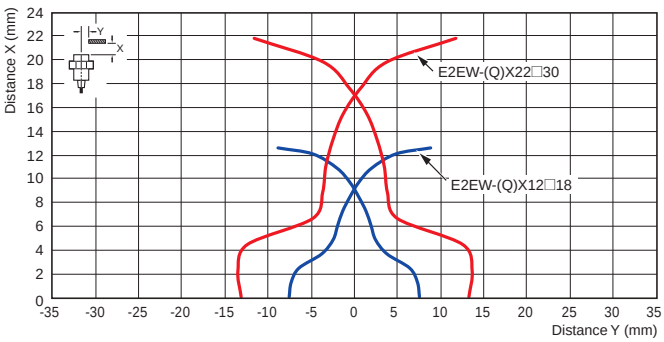
**PREMIUM Model**

### Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

**Sensing object: iron**

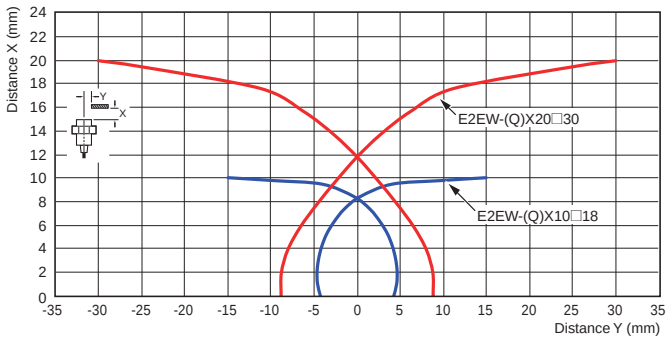



**Sensing object: Aluminum**

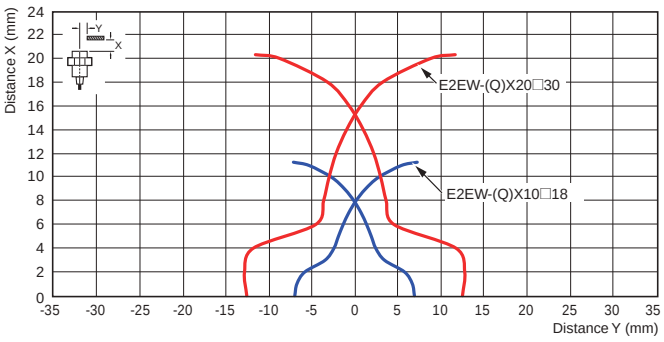



### Triple distance model/ Spatter-resistant Triple distance model Shielded

**Sensing object: iron**



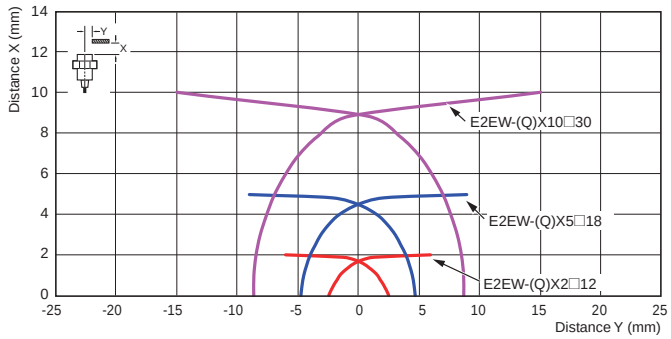

**Sensing object: Aluminum**




**BASIC Model**

### Single distance model/ Spatter-resistant Single distance model Shielded

**Sensing object: iron**

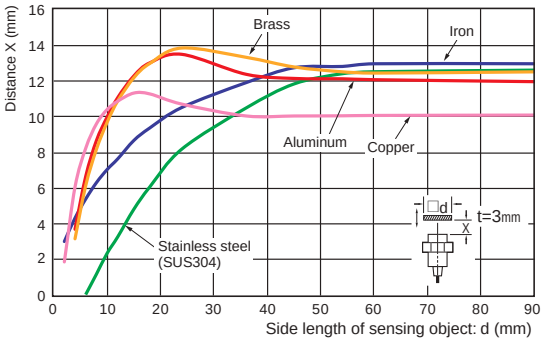


## Influence of Sensing Object Size and Material

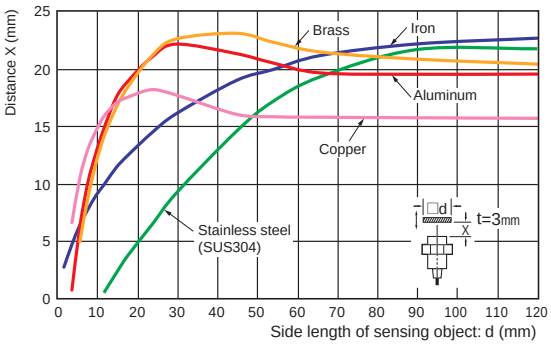
PREMIUM Model

### Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

**Size: M18 E2EW-(Q)X12□18**

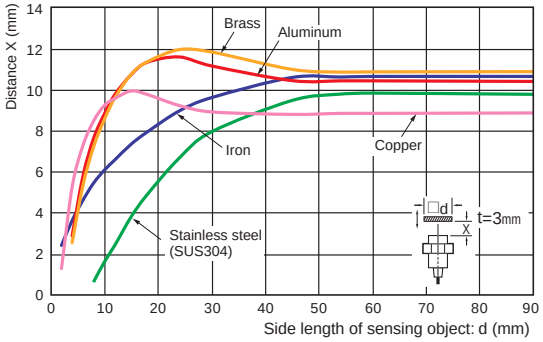



**Size: M30 E2EW-(Q)X22□30**

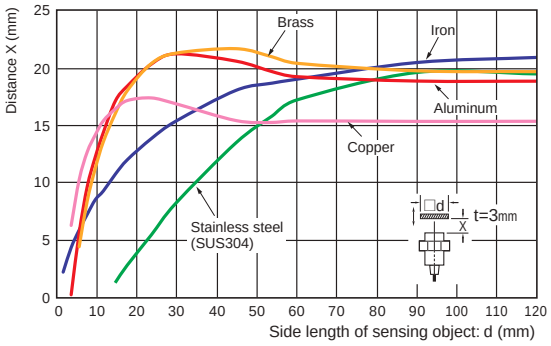



### Triple distance model/ Spatter-resistant Triple distance model Shielded

**Size: M18 E2EW-(Q)X10□18**



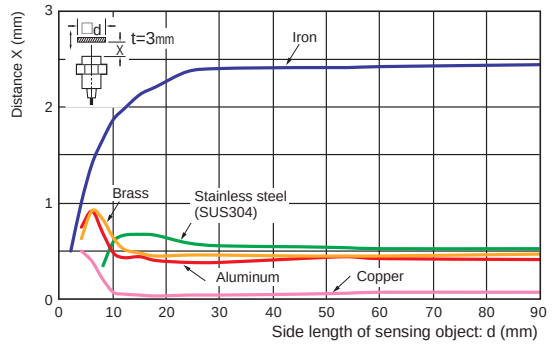

**Size: M30 E2EW-(Q)X20□30**



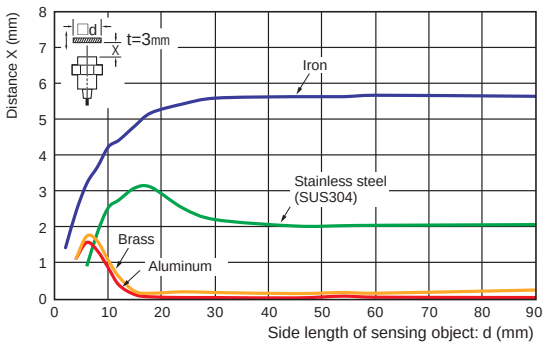
BASIC Model

**Single distance model/**
**Spatter-resistant Single distance model**
**Shielded**

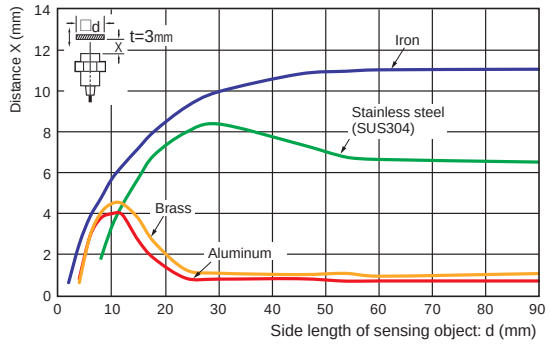
**Size: M12 E2EW-(Q)X2□12**




**Size: M18 E2EW-(Q)X5□18**




**Size: M30 E2EW-(Q)X10□30**

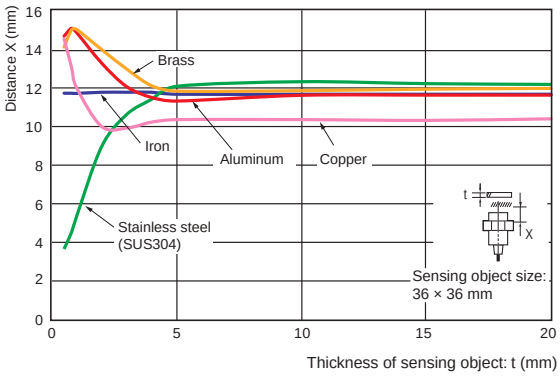


## Influence of Sensing Object Thickness and Material

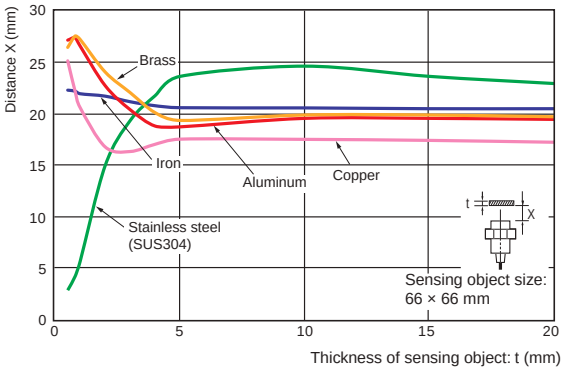
PREMIUM Model

### Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

**Size: M18 E2EW-(Q)X12□18**

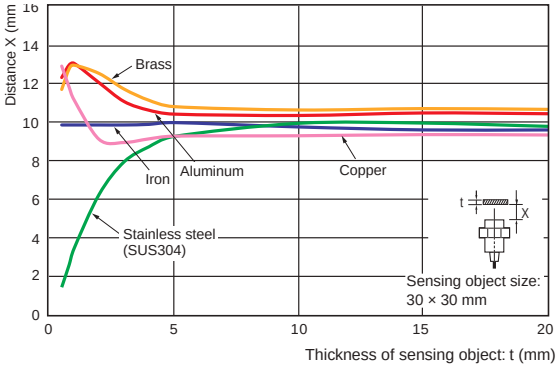



**Size: M30 E2EW-(Q)X22□30**

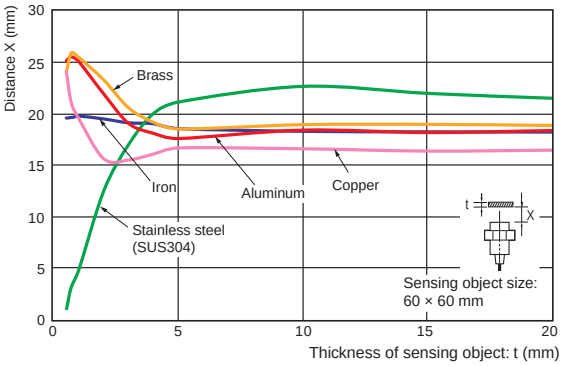



### Triple distance model/ Spatter-resistant Triple distance model Shielded

**Size: M18 E2EW-(Q)X10□18**



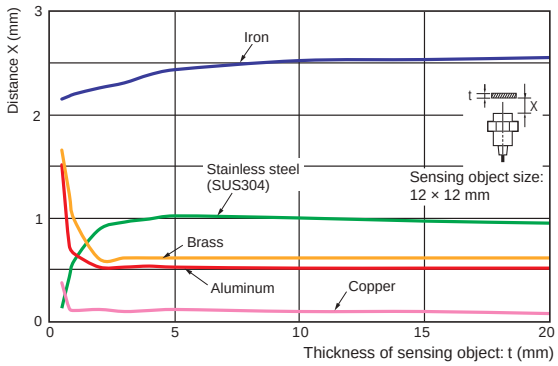

**Size: M30 E2EW-(Q)X20□30**



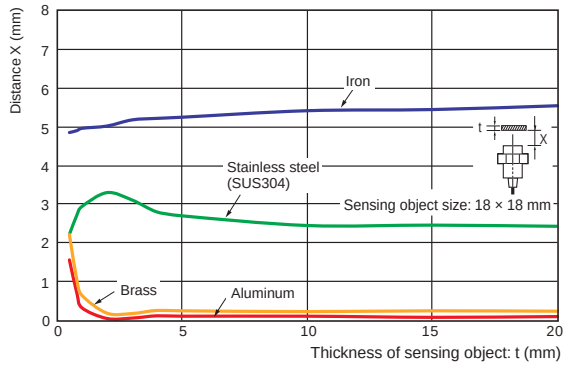
BASIC Model

## Single distance model/ Spatter-resistant Single distance model Shielded

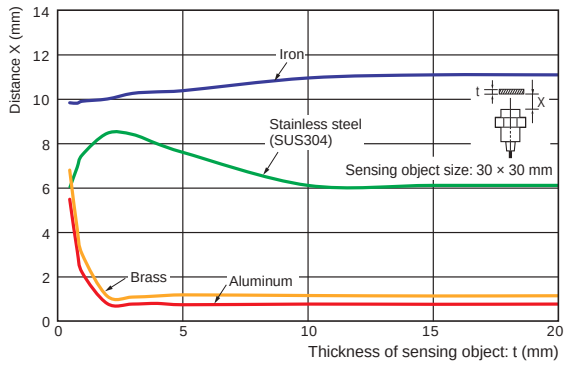
### Size: M12 E2EW-(Q)X2□12




### Size: M18 E2EW-(Q)X5□18




### Size: M30 E2EW-(Q)X10□30

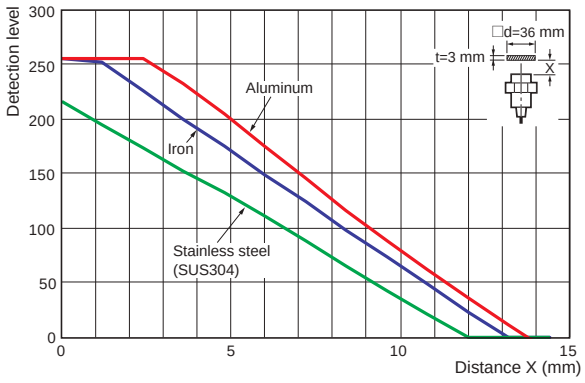


## Monitor Output vs. Sensing Distance

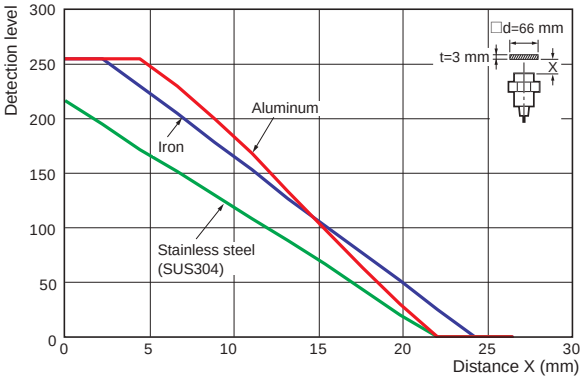
PREMIUM Model

### Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

**Size: M18 E2EW-(Q)X12□18**

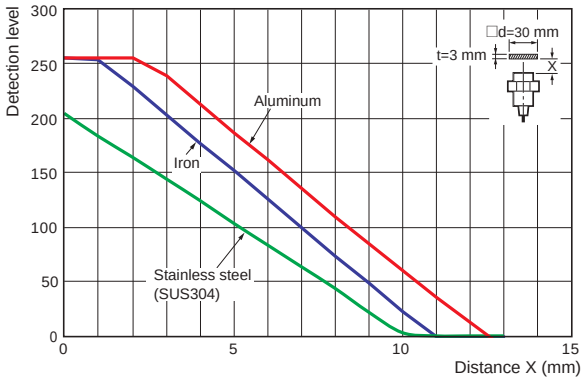



**Size: M30 E2EW-(Q)X22□30**

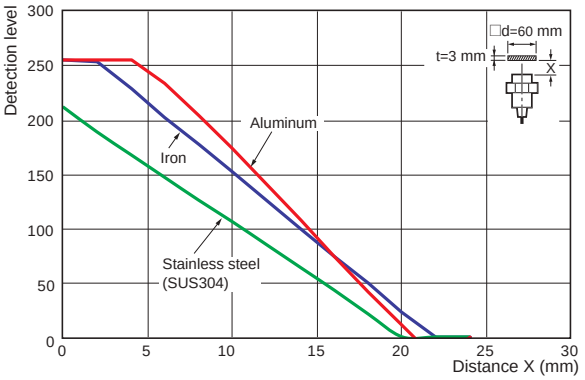



### Triple distance model/ Spatter-resistant Triple distance model Shielded

**Size: M18 E2EW-(Q)X10□18**



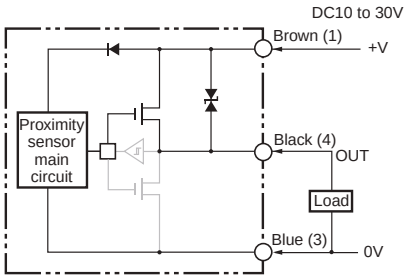
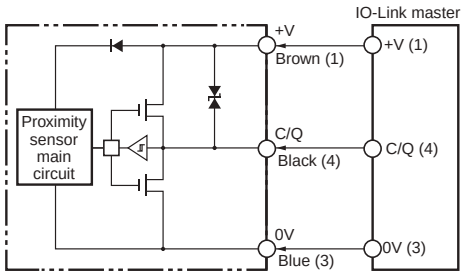
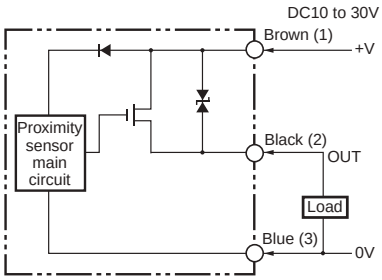
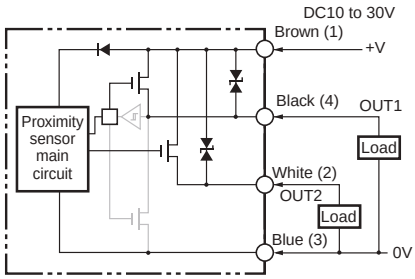
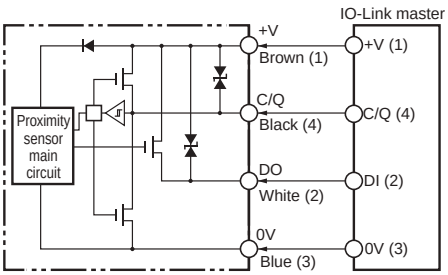

**Size: M30 E2EW-(Q)X20□30**



# I/O Circuit Diagrams/Timing charts

## DC 3-wire

**PNP output** PREMIUM Model

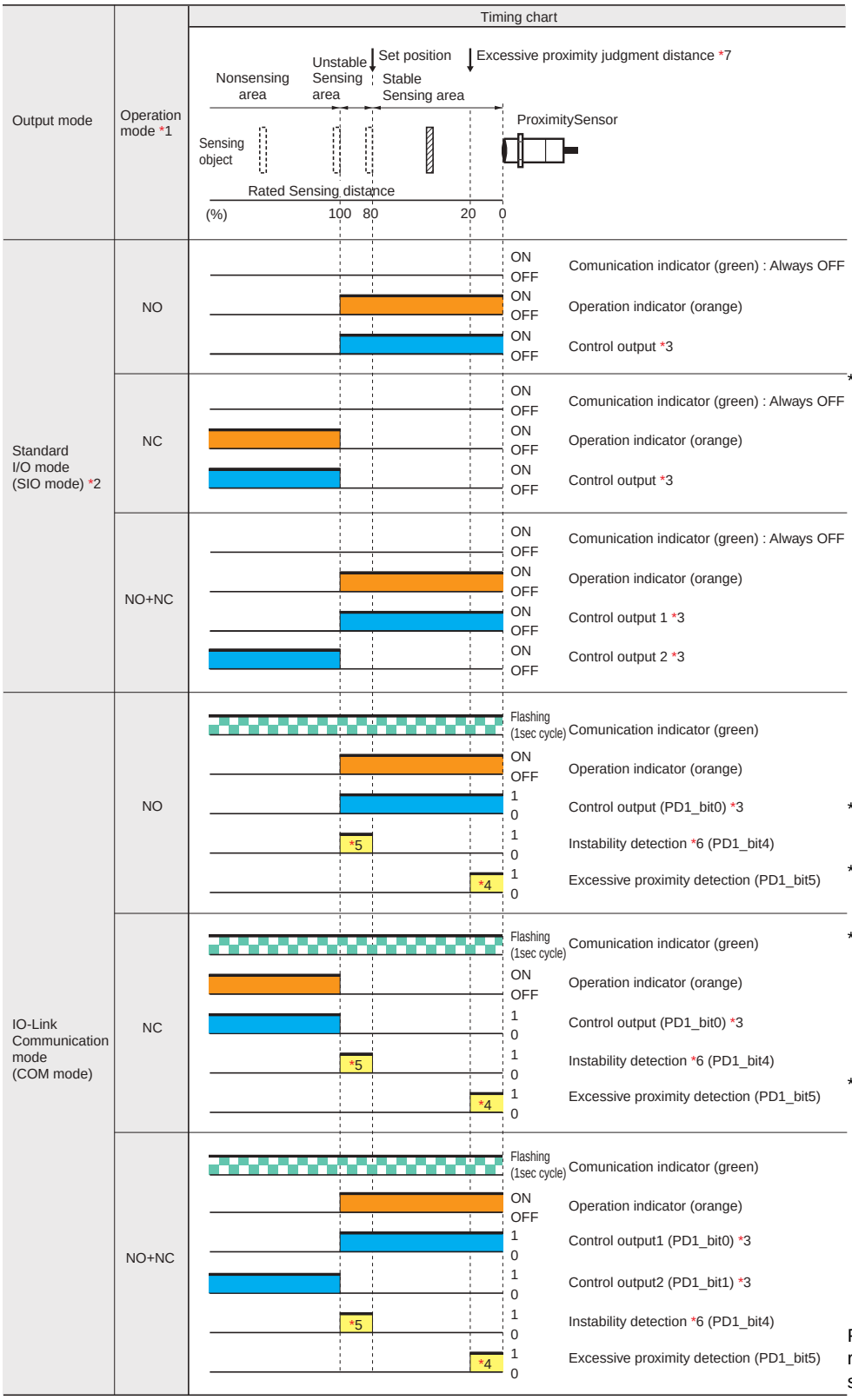
| Operation mode | Model | Output circuit | |
|---|---|---|---|
| | | Standard I/O mode (SIO mode) When using as a general | IO-Link Communication mode (COM mode) When using the Sensor connected to IO-Link Master Unit |
| NO | E2EW-(Q)X□B1 |  |  |
| NC | E2EW-(Q)X□B2 |  | --- |
| NO+NC | E2EW-(Q)X□B3 |  |  |

In the IO-Link mode, the cord between the IO-Link master and sensor must have a length of 20 m or less.

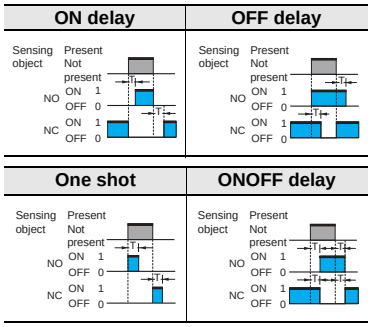
### Connector Pin Arrangement

| M12 Smartclick Connector |
|---|
|  |

## PNP output




*3. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, one-shot, or ONOFF delay function and select a timer time of 1 to 16,383ms (T).)




*4. The excessive proximity diagnosis function can be selected by the IO-Link communications.

*5. The instability detection diagnosis can be selected by the IO-Link communications.

*6. The judgment time for the instability detection diagnosis can be selected by the IO-Link communications. (For the ON delay timer function, the setting can be selected from 0 (invalid), 10, 50, 100, 300, 500, or 1000 ms.)

*7. The judgment distance of the excessive proximity diagnosis function can be selected by the IO-Link communications. (The distance can be selected as a combination of the material of the object detected, such as iron, aluminum, or SUS and the judgment distance of approximately 10, 20, or 30%. However, it is not allowed to select a combination of aluminum and 10%.)

Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

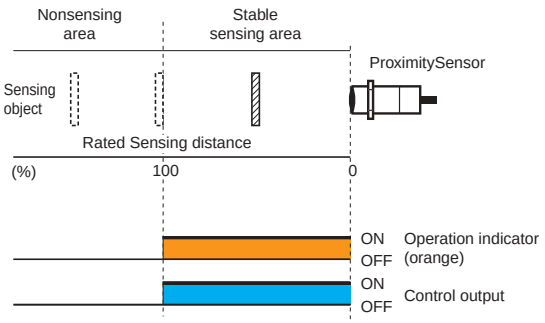
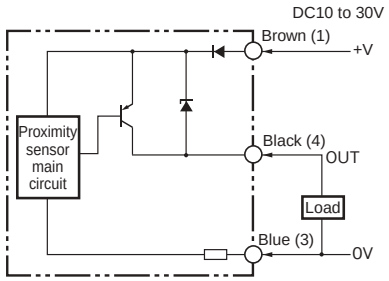
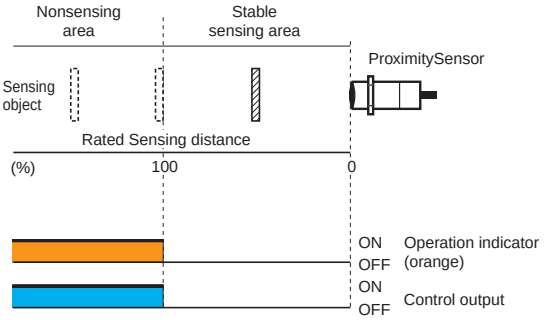
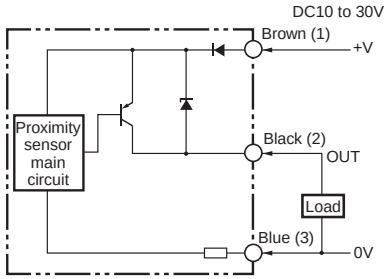
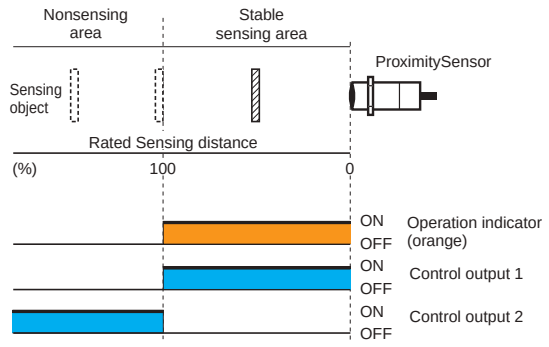
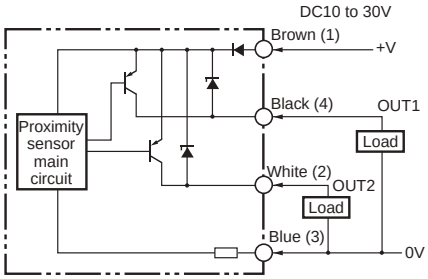
Please contact your OMRON sales representative regarding assignment of data.

*1. For models with IO-Link, the operation mode can be changed by the IO-Link communications.

*2. If using a model with IO-Link as a general sensor or using a model without IO-Link, it operates in the standard I/O mode (SIO mode).

## DC 3-wire

### PNP output BASIC Model

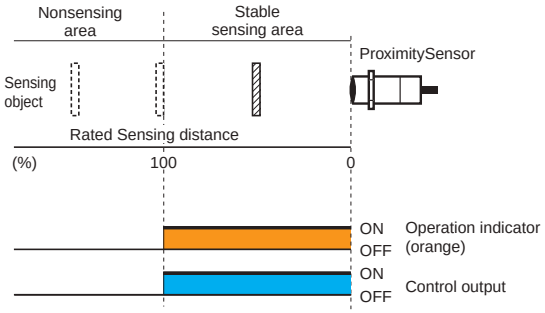
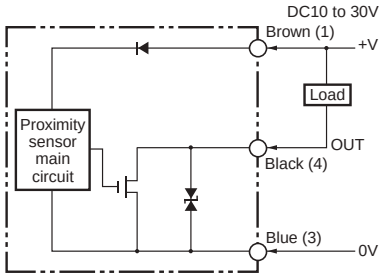
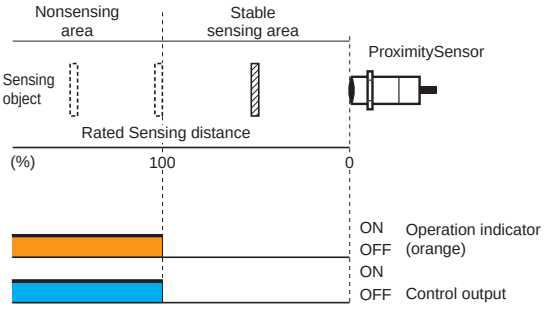
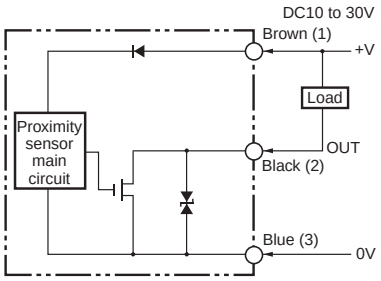
| Operation mode | Model | Timing chart | Output circuit |
|---|---|---|---|
| NO | E2EW-(Q)X□B1 |  |  |
| NC | E2EW-(Q)X□B2 |  |  |
| NO+NC | E2EW-(Q)X□B3 |  |  |

### Connector Pin Arrangement

| M12 Smartclick Connector |
|---|
|  |

## DC 3-wire

### NPN OUTPUT PREMIUM Model

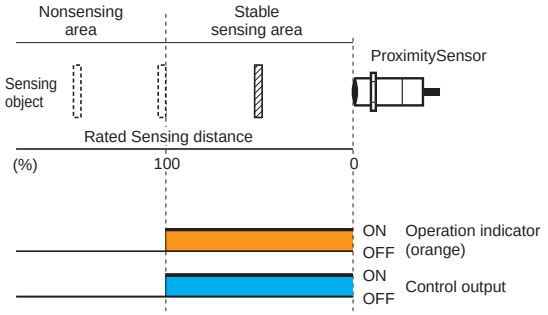
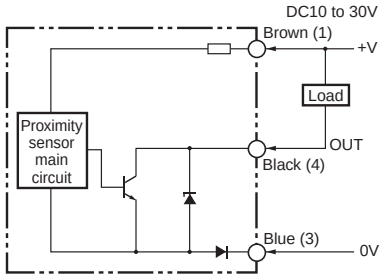
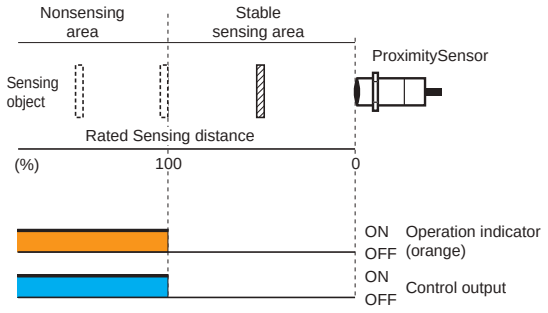
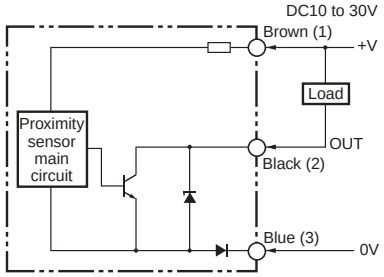
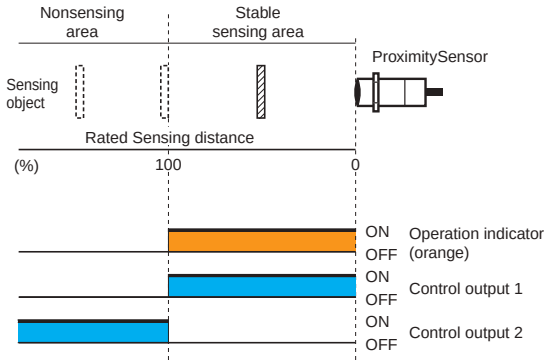
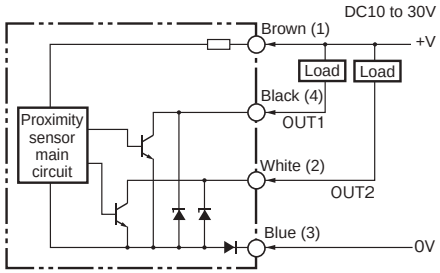
| Operation mode | Model | Timing chart | Output circuit |
|---|---|---|---|
| NO | E2EW-(Q)X□C1 |  |  |
| NC | E2EW-(Q)X□C2 |  |  |

### Connector Pin Arrangement

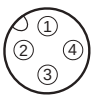
| M12 Smartclick Connector |
|---|
|  |

## DC 3-wire

### NPN OUTPUT BASIC Model

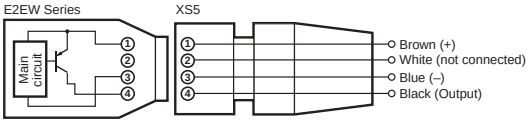
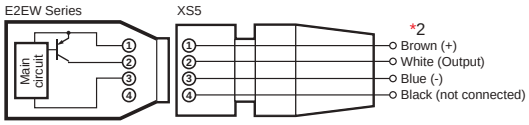
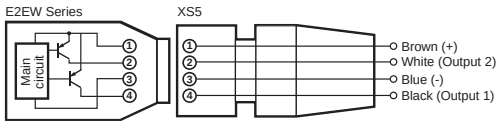
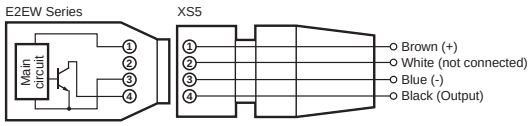
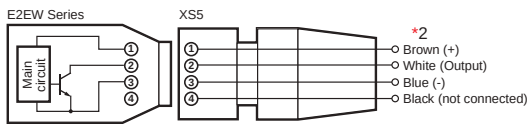
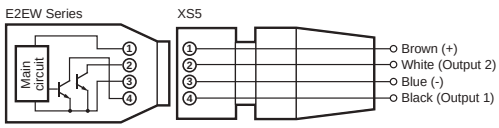
| Operation mode | Model | Timing chart | Output circuit |
|---|---|---|---|
| NO | E2EW-(Q)X□C1 |  |  |
| NC | E2EW-(Q)X□C2 |  |  |
| NO+NC | E2EW-(Q)X□C3 |  |  |

### Connector Pin Arrangement

| M12 Smartclick Connector |
|---|
|  |

# Connections for Sensor I/O Connectors

## DC 3-Wire

| Proximity Sensor | | | | Sensor I/O Connectors | |
|---|---|---|---|---|---|
| Types | Output | Operation mode | Model | Model | Connections *1 |
| DC 3-Wire (M12 Smartclick Connector) | PNP | NO | E2EW-(Q)X□B1□- M1TJ | XS5F-D421-□80-X□<br>XS5F-D42□-□80-F<br>XS5W-D421-□81-X□<br>XS5W-D42□-□81-F<br>**Note:** For details of the connector, refer to *XS5 Series* on page 42. |  |
| | | NC | E2EW-(Q)X□B2□-M1TJ | |  |
| | | NO+NC | E2EW-(Q)X□B3□-M1TJ | |  |
| | NPN | NO | E2EW-(Q)X□C1□-M1TJ | |  |
| | | NC | E2EW-(Q)X□C2□-M1TJ | |  |
| | | NO+NC | E2EW-(Q)X□C3□-M1TJ | |  |

*1. If the XS5W Series Connector which has a socket and plug on the cable ends is connected to the Sensor, this part will be a plug.
*2. Different from Proximity Sensor wire colors.

# Safety Precautions

**Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.**

## Warning Indications

| | |
|---|---|
| ⚠WARNING | **Warning level**<br>Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage. |
| **Precautions for Safe Use** | Supplementary comments on what to do or avoid doing, to use the product safely. |
| **Precautions for Correct Use** | Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance. |

## Meaning of Product Safety Symbols

| | |
|---|---|
|  | **General prohibition**<br>Indicates the instructions of unspecified prohibited action. |
|  | **Caution, explosion**<br>Indicates the possibility of explosion under specific conditions. |

**⚠WARNING**

**This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.**

**Otherwise, explosion may result. Never use the product with an AC power supply.**

## Precautions for Safe Use

The following precautions must be observed to ensure safe operation.

1. Do not use the product in environments subject to flammable or explosive gases.
2. Do not attempt to disassemble, repair, or modify the product.
3. Do not use a voltage that exceeds the rated operating voltage range.
   Applying a voltage that is higher than the operating voltage range may result in explosion or fire.
4. Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or fire.
5. If the power supply is connected directly without a load, the internal elements may explode or burn.
6. Dispose of the product according to applicable regulations (laws).

## Precautions for Correct Use

Do not use the product in any atmosphere or environment that exceeds the ratings.

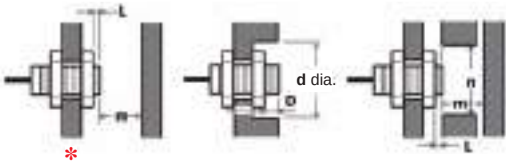
### Operating Environment

1. Do not install the Sensor in the following locations.
   (1) Outdoor locations directly subject to sunlight, rain, snow, waterdroplets, or oil.
   (2) Locations subject to atmospheres with chemical vapors, inparticular solvents and acids.
   (3) Locations subject to corrosive gases.
2. The Sensor may malfunction if used near ultrasonic cleaning equipment, high-frequency equipment, transceivers, cellular phones, inverters, or other devices that generate a high-frequency electric field. Please refer to the Precautions for Correct Use on the OMRON website (www.ia.omron.com) for typical measures.
3. Laying the Proximity Sensor wiring in the same conduit or duct as high-voltage wires or power lines may result in incorrect operation and damage due to induction. Wire the Sensor using a separate conduit or independent conduit.
4. Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.
5. When turning on the power by influence of temperature environment, an outputmis-pulse sometimes occurs. After the sensor has passed for 300 msec after turning on, please use in the stable state.
6. The sensor is adjusted with a high degree of accuracy, so do not use in the environment with sudden temperature change.
7. Operation check is performed using an OMRON's IO-Link master. If using an IO-Link master from another company, perform the operation check in advance.
8. When connecting non IO-Link compliant models to the IO-Link master, use the SIO mode.
9. In the IO-Link mode, the cord between the IO-Link master and sensor must have a length of 20 m or less.

## Design

### Influence of Surrounding Metal

When mounting the Proximity Sensor, ensure that the minimum distances given in the following table are maintained.
If you use a nut, only use the provided nut. And ensure that the minimum distances between the sensing surface and nut is bigger than the "L" given in the following table.
Other non-ferrous metals affect sensor's performance in the same way as aluminum. Perform the operation check in advance.




*

**(Unit: mm)**

#### Mounting panel material: Iron

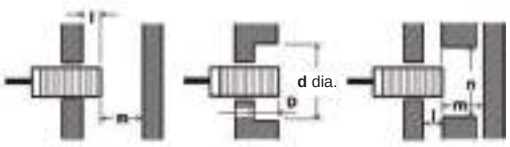
| Models | Model | L | d | D | m | n |
|---|---|---|---|---|---|---|
| Quadruple distance model | E2EW-(Q)X12□18 | 6 | 54 | 6 | 36 | 54 |
| | E2EW-(Q)X22□30 | 8 | 90 | 8 | 66 | 90 |
| Triple distance model | E2EW-(Q)X10□18 | 2 | 54 | 2 | 30 | 54 |
| | E2EW-(Q)X20□30 | 0 | 30 | 0 | 60 | 90 |
| Single distance model | E2EW-(Q)X2□12 | 0 | 12 | 0 | 8 | 40 |
| | E2EW-(Q)X5□18 | 0 | 18 | 0 | 20 | 60 |
| | E2EW-(Q)X10□30 | 0 | 30 | 0 | 40 | 100 |

#### Mounting panel material: Aluminum

| Models | Model | L | d | D | m | n |
|---|---|---|---|---|---|---|
| Quadruple distance model | E2EW-(Q)X12□18 | 12 | 80 | 12 | 36 | 80 |
| | E2EW-(Q)X22□30 | 16 | 120 | 16 | 66 | 120 |
| Triple distance model | E2EW-(Q)X10□18 | 12 | 80 | 12 | 30 | 80 |
| | E2EW-(Q)X20□30 | 16 | 120 | 16 | 60 | 120 |
| Single distance model | E2EW-(Q)X2□12 | 12 | 70 | 12 | 8 | 70 |
| | E2EW-(Q)X5□18 | 12 | 80 | 12 | 20 | 80 |
| | E2EW-(Q)X10□30 | 16 | 120 | 16 | 40 | 120 |

* If you use the model E2EW-(Q)X22□30, or E2EW-(Q)X20□30, the panel thickness (t) is 3 mm or less.

When the Proximity Sensor is mounted in metal, ensure that the minimum distances given in the following table are maintained.




**(Unit: mm)**

#### Embedded material: Iron

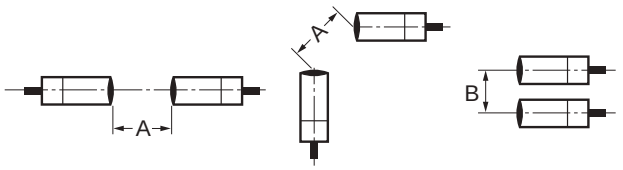
| Models | Model | l | d | D | m | n |
|---|---|---|---|---|---|---|
| Quadruple distance model | E2EW-(Q)X12□18 | 6 | 54 | 6 | 36 | 54 |
| | E2EW-(Q)X22□30 | 8 | 90 | 8 | 66 | 90 |
| Triple distance model | E2EW-(Q)X10□18 | 0 | 18 | 0 | 30 | 54 |
| | E2EW-(Q)X20□30 | 0 | 30 | 0 | 60 | 90 |
| Single distance model | E2EW-(Q)X2□12 | 0 | 12 | 0 | 8 | 40 |
| | E2EW-(Q)X5□18 | 0 | 18 | 0 | 20 | 60 |
| | E2EW-(Q)X10□30 | 0 | 30 | 0 | 40 | 100 |

#### Embedded material: Aluminum

| Models | Model | l | d | D | m | n |
|---|---|---|---|---|---|---|
| Quadruple distance model | E2EW-(Q)X12□18 | 12 | 80 | 12 | 36 | 80 |
| | E2EW-(Q)X22□30 | 16 | 120 | 16 | 66 | 120 |
| Triple distance model | E2EW-(Q)X10□18 | 12 | 80 | 12 | 30 | 80 |
| | E2EW-(Q)X20□30 | 16 | 120 | 16 | 60 | 120 |
| Single distance model | E2EW-(Q)X2□12 | 12 | 70 | 12 | 8 | 70 |
| | E2EW-(Q)X5□18 | 12 | 80 | 12 | 20 | 80 |
| | E2EW-(Q)X10□30 | 16 | 120 | 16 | 40 | 120 |

## Mutual Interference

When installing two or more Proximity Sensors face-to-face or sideby-side, ensure that the minimum distances given in the following table are maintained.




(Unit: mm)

| Models | Model | Item | |
|---|---|---|---|
| | | A | B |
| Quadruple distance model | E2EW-(Q)X12□18 | 80 | 60 |
| | E2EW-(Q)X22□30 | 135 | 110 |
| Triple distance model | E2EW-(Q)X10□18 | 80 | 60 |
| | E2EW-(Q)X20□30 | 135 | 110 |
| Single distance model | E2EW-(Q)X2□12 | 40 | 35 |
| | E2EW-(Q)X5□18 | 65 | 60 |
| | E2EW-(Q)X10□30 | 110 | 100 |

### Chips from Cutting Aluminum

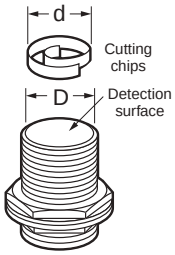
Normally, chips from cutting aluminum will not cause a detection signal to be output even if it adheres to or accumulates on the detection surface. In the following cases, however, a detection signal may be output.

Remove the cutting chips in these cases.

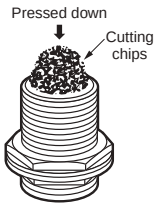
1. If d ≥ 2/3D at the center of the detection surface where d is the cutting chip size and D is the detection surface size

(Unit: mm)

| Model Dimension | D |
|---|---|
| E2EW-(Q)X□12 | 10 |
| E2EW-(Q)X□18 | 16 |
| E2EW-(Q)X□30 | 28 |




2.If the cutting chips are pressed down




## Mounting

### Tightening Force

Do not tighten the nut with excessive force.

A washer must be used with the nut.

The tightening force must be the same or less than the figures in the following table.

**Quadruple distance model, Triple distance model, Single distance model**

| Size | Torque | |
|---|---|---|
| | E2EW-X□ | E2EW-QX□ |
| M12 | 30 N·m | 15 N·m |
| M18 | 70 N·m | 35 N·m |
| M30 | 180 N·m | 60 N·m |

**Note:** When mounting the Proximity Sensor, only use the provided nut. Do not use set screws. The Sensor may malfunction.

# Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

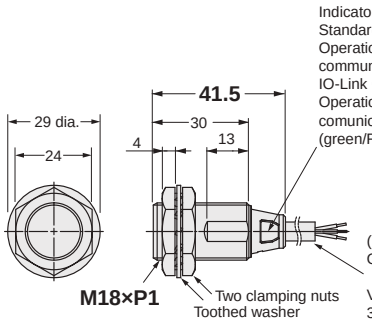
## Sensors

PREMIUM Model

## E2EW/E2EW-Q Series (Quadruple distance/Triple distance/Spatter-resistant Quadruple distance, Spatter-resistant Triple distance model)

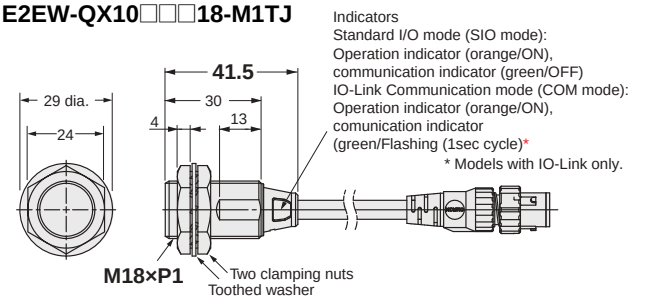
### Pre-wired Model

**E2EW-X12□□□18/E2EW-QX12□□□18**
**E2EW-X10□□□18/E2EW-QX10□□□18**

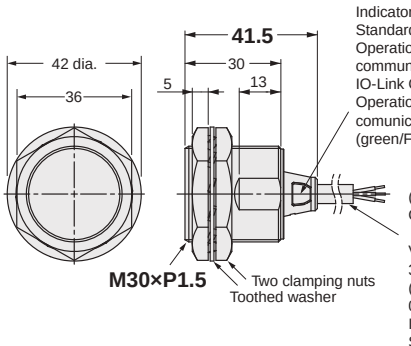



### Pre-wired Connector Model

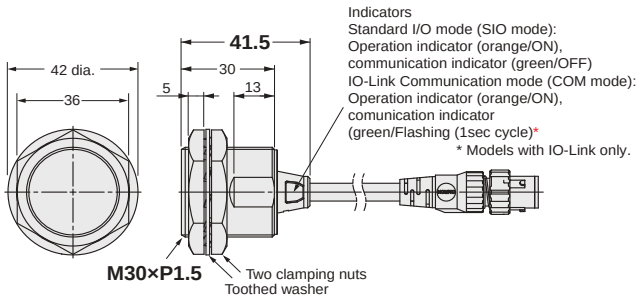
**E2EW-X12□□□18-M1TJ**
**E2EW-X10□□□18-M1TJ**
**E2EW-QX12□□□18-M1TJ**
**E2EW-QX10□□□18-M1TJ**



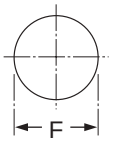

**E2EW-X22□□□30/E2EW-QX22□□□30**
**E2EW-X20□□□30/E2EW-QX20□□□30**




**E2EW-X22□□□30-M1TJ**
**E2EW-X20□□□30-M1TJ**
**E2EW-QX22□□□30-M1TJ**
**E2EW-QX20□□□30-M1TJ**

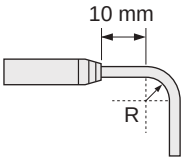



### Mounting Hole Dimensions




| Dimensions | F (mm) |
|---|---|
| M18 | 18.5 dia. $^{+0.5}_{0}$ |
| M30 | 30.5 dia. $^{+0.5}_{0}$ |

### Angle R of the Bending Wire



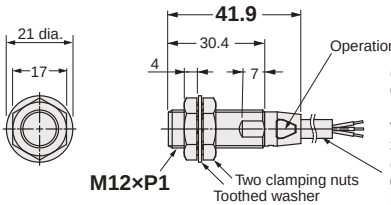

| Dimensions | R (mm) |
|---|---|
| M18 | 18 |
| M30 | |

## BASIC Model E2EW/E2EW-Q Series (Single distance model/Spatter-resistant Single distance model)

### Pre-wired Model

### Pre-wired Connector Model

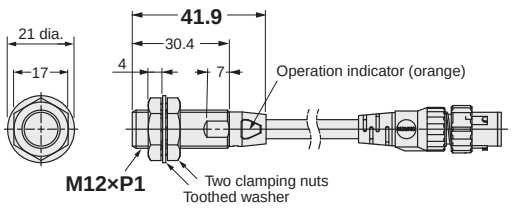
#### E2EW-X2□□12
#### E2EW-QX2□□12




(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

(Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

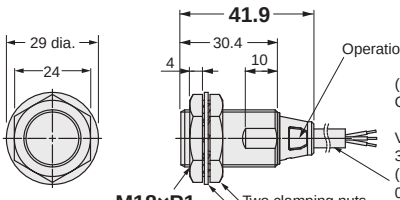
#### E2EW-X2□□12-M1TJ
#### E2EW-QX2□□12-M1TJ




(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

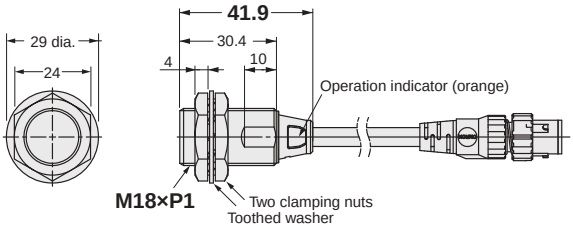
#### E2EW-X5□□18
#### E2EW-QX5□□18




(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

((Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

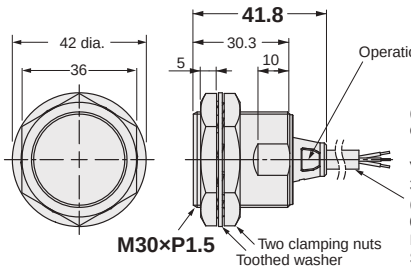
#### E2EW-X5□□18-M1TJ
#### E2EW-QX5□□18-M1TJ




(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

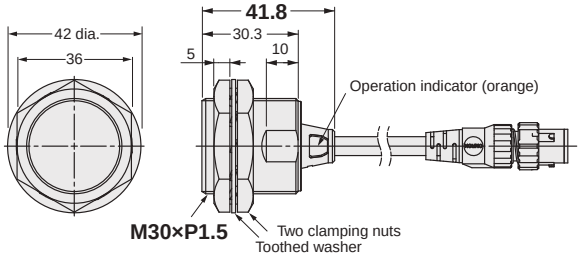
#### E2EW-X10□□30
#### E2EW-QX10□□30




(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

(Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

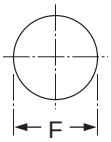
#### E2EW-X10□□30-M1TJ
#### E2EW-QX10□□30-M1TJ




(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

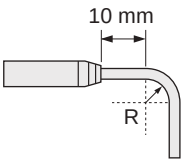
(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

### Mounting Hole Dimensions




| Dimensions | F (mm) |
|---|---|
| M12 | 12.5 dia. $^{+0.5}_{0}$ |
| M18 | 18.5 dia. $^{+0.5}_{0}$ |
| M30 | 30.5 dia. $^{+0.5}_{0}$ |

### Angle R of the Bending Wire




| Dimensions | R (mm) |
|---|---|
| M12 | 18 |
| M18 | |
| M30 | |

# XS5

## Round Water-resistive Smartclick Connectors for E2E NEXT Series proximity sensors that Reduce Installation Work

- A newly developed lock mechanism that is compatible with round M12 connectors.
- Simply insert the Connectors, then turn them approximately 1/8 of a turn to lock.
- A positive click indicates locking.
- IP67 degree of protection.
- UL approved products.

Smartclick

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

⚠ Be sure to read *Safety Precautions* on page 48.

## Model Number Structure

### Model Number Legend

Use this legend when determining the product specifications from the model number. When ordering, use a model number from the table in **Ordering Information**.

**XS5□-D 4 2 □ - □ 8 □ - F**
1 2 3 4 5 6 7 8 9

1. **Type**
   W: Connectors connected to cable, socket and plug on cable ends
   F: Connectors connected to cable, socket on one cable end
2. **Mating Section Form**
   D: A-coding (for DC sensor)
3. **Connector Poles**
   4: 4 poles
4. **Contact Plating**
   2: Gold plating
5. **Cable Connection Direction**
   XS5W
   1: Straight (Socket)/Straight (Plug)
   2: Right-angle (Socket)/Right-angle (Plug)
   3: Straight (Socket)/Right-angle (Plug)
   4: Right-angle (Socket)/Straight (Plug)

   XS5F
   1: Straight
   2: Right-angle
6. **Cable Length**
   C: 1 m
   D: 2 m
   E: 3 m
   G: 5 m
   J: 10 m
7. **Connections** (Numbers inside circles are terminal numbers)
   8: ①Brown, ②White, ③Blue, ④ Black
8. **Connectors on One End/Both Ends**
   0: Sockets on One Cable End
   1: Socket and Plug on Cable Ends
9. **Cable Specifications**
   F: Robot cable

# Ordering Information

## Connectors

| Type | Cable outer diameter (mm) | Cable Connection Direction | Cable length (m) | Model | UL |
|---|---|---|---|---|---|
| **Socket and Plug on Cable Ends XS5W** | 6 dia. | Straight (Socket)/Straight (Plug) | 1 | **XS5W-D421-C81-F** | UL2238 certified (File no. E207683) |
| | | | 2 | **XS5W-D421-D81-F** | |
| | | | 3 | **XS5W-D421-E81-F** | |
| | | | 5 | **XS5W-D421-G81-F** | |
| | | | 10 | **XS5W-D421-J81-F** | |
| | | Right-angle (Socket)/Right-angle (Plug) | 2 | **XS5W-D422-D81-F** | |
| | | | 5 | **XS5W-D422-G81-F** | |
| | | Straight (Socket)/Right-angle (Plug) | 2 | **XS5W-D423-D81-F** | |
| | | | 5 | **XS5W-D423-G81-F** | |
| | | Right-angle (Socket)/Straight (Plug) | 2 | **XS5W-D424-D81-F** | |
| | | | 5 | **XS5W-D424-G81-F** | |
| **Sockets on One Cable End XS5F** | 6 dia. | Straight type | 1 | **XS5F-D421-C80-F** | |
| | | | 2 | **XS5F-D421-D80-F** | |
| | | | 3 | **XS5F-D421-E80-F** | |
| | | | 5 | **XS5F-D421-G80-F** | |
| | | | 10 | **XS5F-D421-J80-F** | |
| | | Right-angle type | 1 | **XS5F-D422-C80-F** | |
| | | | 2 | **XS5F-D422-D80-F** | |
| | | | 3 | **XS5F-D422-E80-F** | |
| | | | 5 | **XS5F-D422-G80-F** | |
| | | | 10 | **XS5F-D422-J80-F** | |

# Accessories (Sold Separately)

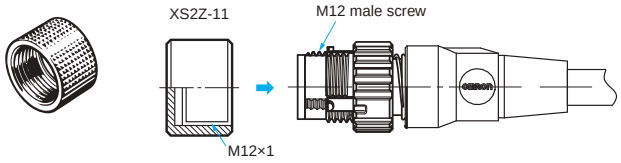
## Connector Covers

### Water-resistive Covers

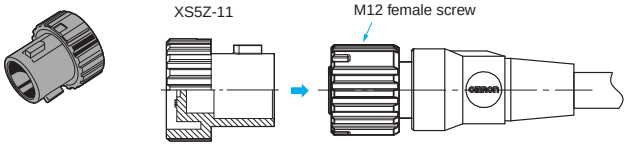
| Model | Material | Suitable connector | | Remarks |
|---|---|---|---|---|
| | | Model | Mounting portion | |
| **XS2Z-11** | Brass/ Nickel plated | XS5W | M12 male screw | This provides IP67 levels of protection.<br>When mounting the Water-resistive Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten the Water-resistive Cover. |
| **XS5Z-11** | PBT | XS5F/XS5W | M12 female screw | This provides IP67 levels of protection.<br>This uses the Smart click mechanism. There's no need to keep track of locking torque. |

**Water-resistive Covers**

**XS2Z-11**




**XS5Z-11**

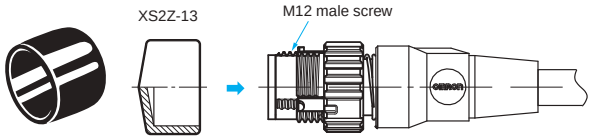



### Dust Covers

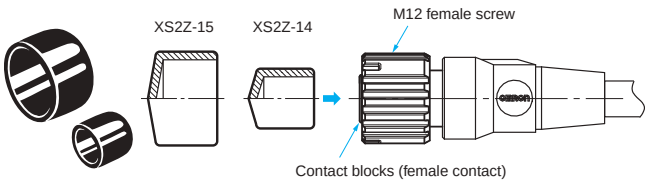
| Model | Material | Suitable connector | | Remarks |
|---|---|---|---|---|
| | | Model | Mounting portion | |
| **XS2Z-13** | Rubber/Black | XS5W | M12 male screw | The Dust Cover is for dust prevention and does not ensure IP67 degree of protection.<br>When mounting the Dust Cover to a connector, be sure to press the Dust Cover onto the Connector until the Connector is fully inserted into the Dust Cover. |
| **XS2Z-14** | | XS5F/XS5W | Contact blocks (female contact) | |
| **XS2Z-15** | | | M12 female screw | |

**Dust Covers**

**XS2Z-13**




**XS2Z-15/XS2Z-14**



# Ratings and Specifications

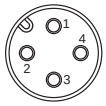
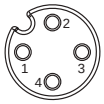
| | |
|---|---|
| **Rated current** | 4 A |
| **Rated voltage** | 250 VDC |
| **Contact resistance (connector)** | 40 mΩ max. (at 20 mV max., 100 mA max.) |
| **Insulation resistance** | 1,000 MΩ min. (at 500 VDC) *1 |
| **Dielectric strength (connector)** | 1,500 VAC for 1 minute (leakage current: 1 mA max.) |
| **Degree of protection** | IP67 (IEC 60529) |
| **Insertion tolerance** | 50 times |
| **Lock strength** | Tensile: 100 N/15 s, Torsion: 1 N·m/15 s |
| **Cable holding strength** | Tensile: 100 N/15 s, Torsion: 1 N·m/15 |
| **Lock operating force** | 0.1 to 0.25 N·m |
| **Ambient operating temperature range** | -25 to 70°C *2 |
| **Ambient humidity range** | 20 to 85%RH |

**✻1.** State at shipping.
**✻2.** Use the robot cable within a temperature range of 0 to 70°C to avoid the wire breakage when moving.

## Materials and Finishes

| Model / Item | XS5W/XS5F |
|---|---|
| **Contacts** | Copper alloy/Gold plating |
| **Fixtures** | Zinc alloy/Nickel plationg |
| **Pin block** | PBT resin |
| **O-ring** | Rubber |
| **Cover** | PBT resin |
| **Cable** | UL13 (CL3), UL758 (AWM), 6 mm dia., AWG20 |

## Connector Pinout Diagram (from Mating Side)

| Item | No. of poles | 4 poles |
|---|---|---|
| **A-coding (For DC sensors)** | **Male (plug) contacts** |   |
| | **Female (socket) contacts** |   |

# Connection

| Socket | Plug: OMRON model No. | Smartclick Plug Connectors: XS5H, XS5G, XS5W (plug side), XS5R (plug side), XS5M * | M12 Plug Connectors: XS2H, XS2G, XS2W (plug side), XS2R (plug side), XS2M * |
|---|---|---|---|
| **Smartclick Socket Connectors** | **XS5F, XS5C XS5W (socket side), XS5R (socket side), XS5P *** | ⊙ | ❍ |
| **M12 Socket Connectors** | **XS2F, XS2C, XS2W (socket side), XS2R (socket side), XS2P *** | ❍ | ❍ |

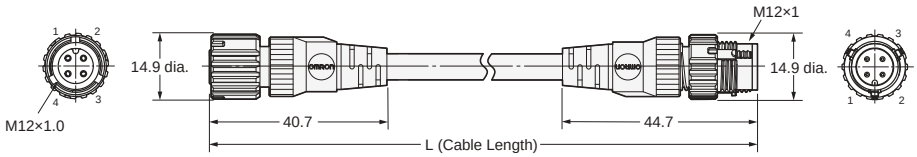
✻ XS2P/XS5P and XS5M, XS2M cannot mate with each other.
**Note:** ⊙: Connected by twisting.
❍: Connected by screwing.

# Dimensions

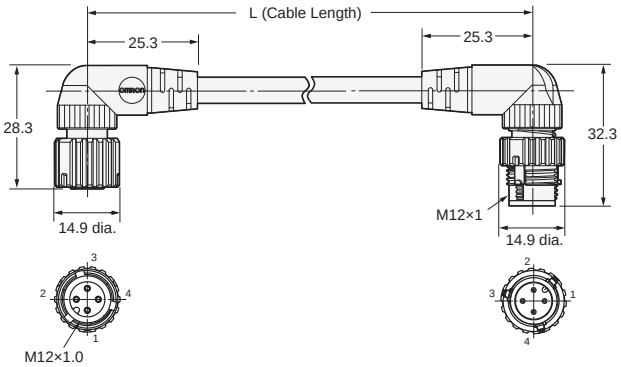
(Unit: mm)

### Socket and Plug on Cable Ends XS5W

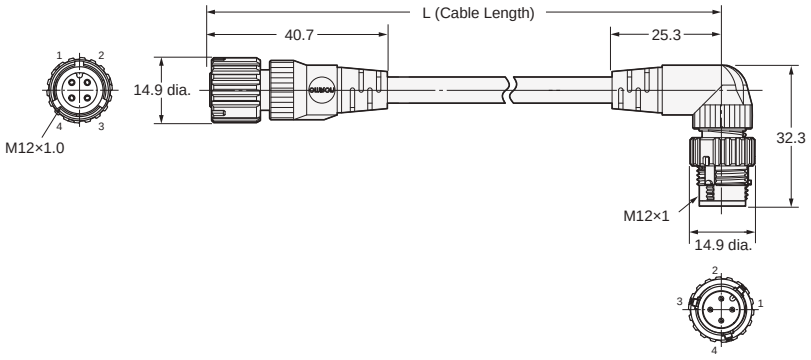
**Straight (Socket)/straight (Plug)**
**XS5W-D421-☐81-F**



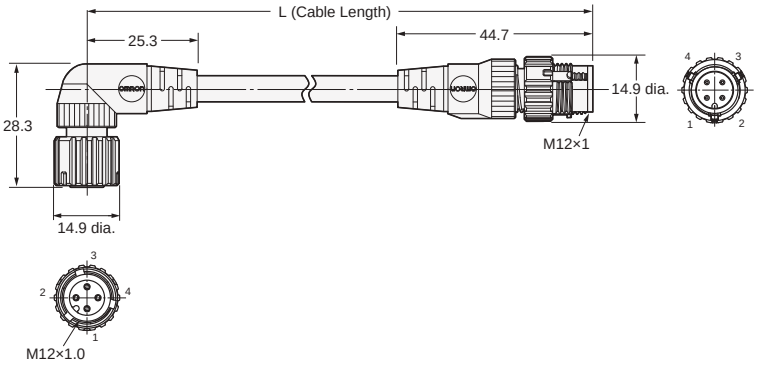

**Right-angle (Socket)/right-angle (Plug)**
**XS5W-D422-☐81-F**



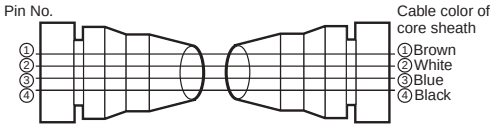

**Straight (Socket)/right-angle (Plug)**
**XS5W-D423-☐81-F**




**Right-angle (Socket)/straight (Plug)**
**XS5W-D424-☐81-F**

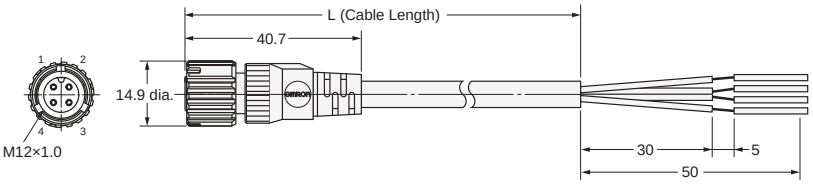



### Wiring Diagram for 4 Cores

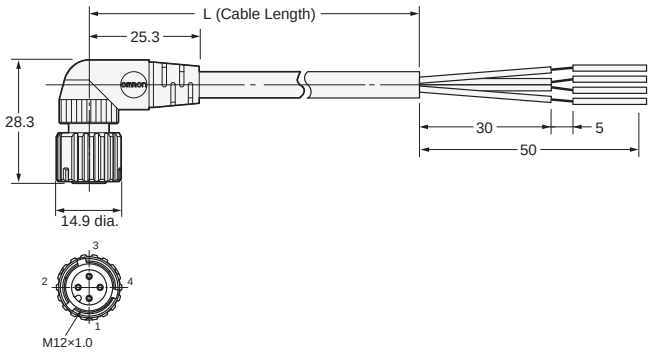


## Sockets on One Cable End XS5F

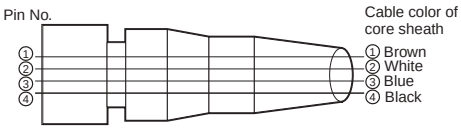
### Straight type
### XS5F-D421-□80-F




### Right-angle type
### XS5F-D422-□80-F




### Wiring Diagram for 4 Cores



# Safety Precautions

## Meaning of Display

| | |
|---|---|
| **Precautions for Safe Use** | Supplementary comments on what to do or avoid doing, to use the product safely. |
| **Precautions for Correct Use** | Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction, or undesirable effects on product performance. |

## Precautions for Safe Use

### Degree of Protection

Do not use the product if its protective capabilities have been compromised, such as through swelling or cracks to housing or seal materials.
Breakages or damage from fire may occur when products in this state continue to be used.

### Connector Connection and Disconnection

- When connecting or disconnecting Connectors, be sure to hold the Connectors by hand.
- Do not hold the cable when disconnecting Connectors.
  Check the alignment using the slot in the polarity key.
- Do not wiring the Connector when your hands are wet. Malfunctions or device damage may occur when power is supplied to a device.
- When mating Connectors, be sure to insert the plug all the way to the back of the socket before attempting to lock the Connectors.
  After you lock a Connector, always confirm that it is mated properly.
- Do not use tools of any sort to mate the Connectors. Always use your hands. Pliers or other tools may damage the Connectors.
- When you replace a Connector, make sure that there is no liquid, cutting oil, or other foreign matter on the mating surfaces before you mate the Connector.

### Disposal

Dispose of this product as industrial waste.

## Precautions for Correct Use

- Do not use the Connectors in an atmosphere or environment that exceeds the specifications.
- Always turn OFF the power supply before wiring. Failure to turn OFF the power supply may lead to electric shock or damage to devices.
- Environments with corrosive gases and high temperature and humidity can cause bad connections and damage through corrosion, leading to degraded performance, therefore do not use these products in such environments.
- Do not pull on the Connectors or cables with excessive force.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.
- Lay the cable where it will not be stepped on to prevent the wires in the cable from being disconnected and to protect the Connectors from being damaged. If the cable must be placed where it will be stepped on, install a protective cover.
- At installation, if not installing sensors or switches, and not mating plug connectors, then use water-resistant covers (XS5Z-11, XS2Z-11) or dust-resistant covers (XS2Z-13/14/15) in order to ensure correct connector mating.

### Wiring

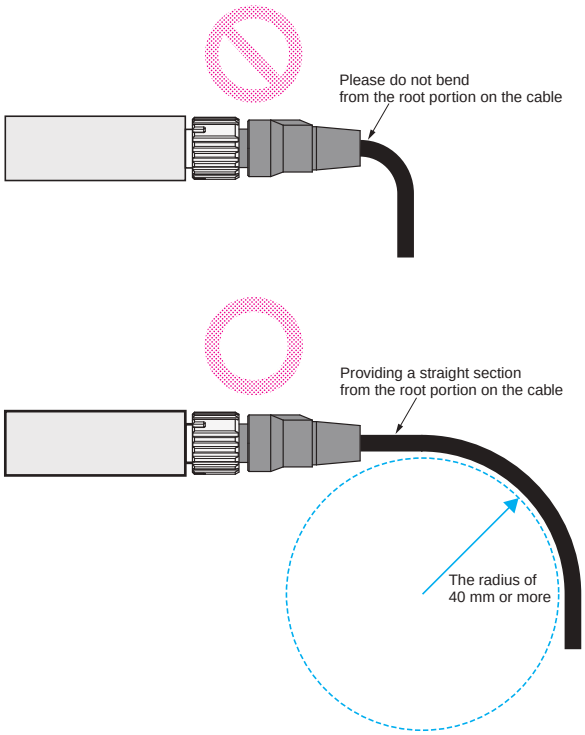
- Do not wire cables in environments in which the cable terminal sections will be subject to fluids such as water or cutting oil.
- When wiring cables, ensure this is carried out in accordance with the wiring diagram.
- Lay the cables so that external force is not applied to the Connectors. Otherwise, the degree of protection (IP67G) may not be achieved.

### Degree of Protection (IP67)

- The degree of protection of Connectors (IP67) is not for a fully watertight structure. Do not use the Connectors underwater.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.

### Setup

- Do not install the Connectors with a load placed directly on the joint or at the point where the wires connect to the Connector.
  The Connector may be damaged or the wires in the cable may be disconnected.
- If bending cables, ensure that these use a minimum bend radius of 40 mm.



# Connecting

## 1. Connecting the XS5 Plug and Socket

- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.


- Hold the knurled socket grip, then insert the projection on the plug into the groove of the socket.


- Turn the knurled grips of the socket clockwise approximately 1/8 turn in respect to the plug. A click will indicate that the Connectors are locked. The locking condition can also be confirmed by the alignment marks on the plug and socket.


## 2. Connecting the XS5 and XS2

- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.
- In the same way as when connecting two XS2 Connectors, screw the knurled grip in the clockwise direction.
- Use your fingers to tighten the Connectors sufficiently.

MEMO

# Terms and Conditions Agreement

## Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## Programmable Products.

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## Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

## Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Related products

## Proximity Sensors
DC 2-Wire and 3-Wire Models

# E2E NEXT Series

- Exceptional sensing range[*1] approximately double the sensing distance of previous models.
- With high-brightness LED, the indicator is visible anywhere from 360°.
- Only 10 seconds[*2] to replace a Proximity Sensor with the "e-jig" (Mounting Sleeve).
- Cables with enhanced oil resistance enabled 2-year oil resistance[*3].

*1. Based on December 2018 OMRON investigation.
*2. Time required to adjust the distance when installing a Sensor. Based on OMRON investigation.
*3. Refer to *Ratings and Specifications* on the catalog for details.
However, E2E Connector Models and E2EQ series are excluded.

Refer to the catalog for details.
Cat. No. D121

## Exceptional sensing range Proximity Sensors (E2E NEXT Series / E2EW Series)

**More E2E NEXT and E2EW products are scheduled to be released for the complete lineup.** (As of December 2019)

| | Proximity Sensors E2E NEXT Series | | Welding Proximity Sensors E2EW Series | |
|---|---|---|---|---|
| | DC 3-wire | DC 2-wire | DC 3-wire | DC 2-wire |
| PREMIUM Models | Available IO-Link | Available | Available IO-Link | — |
| BASIC Models | Available IO-Link | Scheduled for release | Available | Scheduled for release |



**OMRON Corporation** **Industrial Automation Company**
**Kyoto, JAPAN**
**Contact: www.ia.omron.com**

***Regional Headquarters***
**OMRON EUROPE B.V.**
Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

**OMRON ELECTRONICS LLC**
2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

**OMRON ASIA PACIFIC PTE. LTD.**
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

**OMRON (CHINA) CO., LTD.**
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

**Authorized Distributor:**



CSM_3_1_0120
**Cat. No. D122-E1-02** 1219 (0619)